Translation

PATENT COOPERATION TREATY

PCT/EP2003/008884

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2710_S PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/008884	International filing date (*day/month/year*) 11 August 2003 (11.08.2003)	Priority date (*day/month/year*) 12 August 2002 (12.08.2002)
International Patent Classification (IPC) or national classification and IPC B60T 8/32, 13/68		
Applicant KNORR-BREMSE SYSTEME FÜR NUTZFAHRZEUGE GMBH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 9 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
12 March 2004 (12.03.2004)	26 August 2004 (26.08.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP2003/008884

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 7-16, as originally filed
pages _____, filed with the demand
pages 1-6, filed with the letter of 02 July 2004 (02.07.2004)

☒ the claims:

pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages 1-11, filed with the letter of 02 July 2004 (02.07.2004)

☒ the drawings:

pages 1/3-3/3, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRE[redacted]INARY EXAMINATION REPORT

Inte[redacted]nal application No.
PCT/EP 03/08884

V. **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-11	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-11	NO
Industrial applicability (IA)	Claims	1-11	YES
	Claims		NO

2. Citations and explanations

Novelty

The features of the present claim 1 are not known together from a single prior art document.

The pressure control module of the present claim 1 therefore satisfies the criterion of novelty of PCT Article 33(2) and PCT Rule 64.1 - 64.3.

Claims 2 to 11 are directly or indirectly dependent on claim 1. The subjects of these claims are therefore likewise novel (PCT Article 33(2)).

Inventive step

Document DE4227084A, embodiment in figure 2a, is considered the prior art closest to the subject matter of claim 1. Said document discloses (the references in parentheses relate to said document):

A pressure control module (100) for a compressed air braking system for a motor vehicle, in particular a utility vehicle, for the wheel-slip-dependent control or regulation of braking pressures applied to two separate

working connections (18, 19), said module containing a two-channel valve unit (1) with one relay valve (3, 4) per channel (18, 19), **wherein** the control inputs (5) of each of the two relay valves (3, 4) are associated, without the intermediate connection of further valves, with a magnetic control valve (30, 30') designed as a proportional valve, and the magnetic control valves together with merely one single further upstream magnetic control valve (12) connect the control input (5) of the respective relay valve (3, 4) to the bleeding unit (11, 11'), a control pressure (13, 14) or a compressed air supply (17).

The subject matter of the present claim 1 differs therefore from the known pressure control module in that the magnetic control valves are designed as 3-2 directional-control valves with two switching positions, instead of as proportional valves.

However, attention is drawn to the fact that 3-2 directional-control valves by definition have 3 connections and 2 switching positions and that the 3-2 directional-control valves of the invention can, according to the teaching of the present application, be switched alternately between pressure increase and pressure decrease positions so as to maintain pressure - see, for example, the present claim 5 (original claim 6).

It is apparent from column 4, lines 5 to 62 of DE4227084A that the proportional valves (30, 30') replace the pilot valves (7, 8, 9, 9') of figure 2 and are intended to enable each channel to assume a pressure maintenance function.

A person skilled in the art of brakes is familiar with documents US6371573B and WO92/16400A, which disclose

3-2 directional-control valves for maintaining pressure by alternately switching between pressure increase and pressure decrease positions. Furthermore, the speed of pressure increase and pressure decrease is altered by temporally altering the switching from one position to the other. These 3-2 directional-control valves thus function in a similar way to proportional valves.

Note: With proportional valves, to achieve the final switching positions and the different intermediate switching positions, the current is varied (in a analog manner), as is known, whereas with 3-2 directional-control *valves such as are known from US6371573B or WO92/16400A, the average current value is set by (digitally) altering the switching frequency.*

Consequently, it is obvious for a person skilled in the art seeking valves for the valves (30, 30') of DE4227084A to choose 3-2 directional-control valves having two switching positions which, as in the present invention, enable pressure to be maintained by alternately switching between the pressure increase position and the pressure decrease position. In this way, said person would arrive at the pressure control module of the present invention/the present independent claim 1 without thereby being inventive (PCT Article 33(3)). The present application does not therefore meet the requirements of PCT Article 33(1).

Note: According to DE4227084A, the working connection of each relay valve is connected to two wheel brake cylinders, whereas in US6371573B (figures 6 or 7), only one wheel brake cylinder appears to be connected to the working connection of each relay valve. In document WO92/16400A, the working connection of the relay valve is

connected to a plurality of wheel brake cylinders (30) [page 3, line 38 to page 4, line 3], in other words, at least two, as in DE4227084A. The number of wheel brake cylinders attached to the working connection of the relay valve is irrelevant to the functioning of the 3-2 directional-control valves of US6371573B or WO92/16400A. A person skilled in the art would therefore take into consideration documents US6371573B or WO92/16400A. Moreover, nowhere is it indicated in the present application [see, for example, page 7, lines 16 to 25] that, as per the invention, only one wheel brake cylinder is intended to be connected to the working connections of the relay valves and/or that the wheel brake cylinders are intended to be mounted on one axle. This feature is not included in the present independent claim 1 either.

DE422708A likewise discloses the features of claims 2, 3 and 5 to 8. Furthermore, US6371573B discloses the features of claims 3 and 4. The obvious combination of documents DE4227084A and US6371573B thus leads to the subjects of claims 1 to 8. Claims 1 to 8 are therefore not inventive (PCT Article 33(3)).

The features of claims 9 to 11 are likewise known from the prior art - see:

- claim 9: document CH644314A
- claim 10: document DE3308546A
- claim 11: document EP0922618A or document WO02/16179A.

Using the known combination of features of claims 9 to 11 for the same purpose in a pressure control module as per the prior art does not involve an inventive step (PCT Article 33(3)).